Research on Construction Path of Intelligent Training Base in Higher Vocational Colleges

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Abstract. With the development of artificial intelligence technology, the construction of digital and intelligent training bases has become a common requirement for the professional development of vocational colleges. This article is based on artificial intelligence technologies such as virtual simulation, daiase, and cloud platform to create an intelligent networked vehicle training base. The training teaching simulation system, training teaching management platform, and training teaching evaluation system are respectively constructed, providing reference for the construction of training bases in vocational colleges. Practice has proven that digital and intelligent training bases can effectively solve the problems exposed in the construction and operation of traditional training bases, such as lagging practical teaching resources, single practical management mode, and low practical evaluation level.

Keywords: artificial intelligence; Virtual simulation; Cloud platform; Training Base.

1 Introduction

The Intelligent Connected Vehicle Training Base aims at the direction of technological transformation and industrial optimization and upgrading of intelligent connected vehicles, closely combining with the cultivation of skilled talents in the intelligent connected vehicle industry cluster [1, 2]. In accordance with the principles of "scientific planning, school enterprise collaboration, joint construction and sharing, highlighting key points, improving efficiency, and sustainable development", it integrates resources from multiple cooperative enterprises, with the goal of "complete teaching staff, complete functions, sufficient workstations, and intelligent management", Open up the chain of basic teaching, production development, achievement transformation, skilled talent cultivation, and industrialization[3].

The training base focuses on skill training areas such as final assembly, welding, painting, and after-sales maintenance of intelligent connected vehicles, as well as experimental training areas such as installation, testing, calibration, perception algorithm verification, software and hardware fault diagnosis of core components of intelligent connected vehicles [4]. This effectively promotes the effective connection between the education chain, talent chain, industry chain, and innovation chain.

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2 The main problems of traditional training bases

2.1 Delayed practical teaching resources.

At present, some vocational colleges have outdated practical training teaching resources, inadequate digital resource construction, lack of reference to international or domestic industry standards, insufficient comprehensive consideration of subject and major planning, emphasis on theoretical knowledge teaching, and neglect of students' mastery of technical knowledge, which limits their understanding ability. Practical training teaching resources have not been improved and innovated within their lifecycle, affects construction quality and post management.

2.2 Single practical training management mode.

With the continuous deepening of practical teaching, the types and quantities of training equipment continue to increase. Different majors and courses offer different types and depths of practical training, and the workload of practical management continues to increase [5, 6]. High requirements are put forward for course arrangement, equipment management, venue coordination, and other aspects of practical teaching. In order to achieve the goal of real-time monitoring and control of the usage status of training equipment, maximize the utilization of various training teaching venues and instruments, and avoid problems such as repeated purchase, idle storage, and unmanned maintenance of training equipment, a single training teaching management mode can no longer meet the needs of training teaching.

2.3 Improper evaluation methods for practical training.

In the process of practical training and teaching, some vocational colleges have failed to effectively collect, analyze, and evaluate practical training assessment data [7]. The traditional evaluation model for practical teaching can be roughly divided into two categories: one is one-way assessment and evaluation, where student complete operations through imitation, and teachers grade based on the results of practical training reports, lacking evaluation of students during the training process. The second is centralized assessment. After learning, students will draw lots from the training projects they have learned at this stage for assessment and scoring, which is random and contingency. The above evaluation methods for practical training ignore that students' learning process is a continuous exploration, exercise, and accumulation process, which hinders their subjective initiative in practical training.

3 Training Management System Based on Artificial Intelligence Technology

3.1 Digital Training Resources Based on PanoSIM Software.

Relying on the construction of the intelligent connected vehicle training base, the combination of multimedia, big data, 3D modeling, artificial intelligence, human-computer interaction, virtual reality, augmented reality, cloud computing and other technical means, and giving full play to the technical advantages of virtual simulation, can enable learners to create an intelligent connected vehicle virtual simulation system Virtual teaching and training software such as in-

telligent transportation desktop training system, intelligent connected vehicle "digital" supervision system, and VR interactive teaching materials such as intelligent connected vehicle power system and control technology extend classroom teaching through the network, so that online learning runs through the entire learning and practice process. Taking the chassis control by wire training platform as an example, the system is based on the MATLAB/Simulink visual simulation, on-board sensors, navigation communication and other modules in PanoSim software. According to the vehicle experimental data and physical parameters, a virtual simulation model is established, which can carry out the structural cognition of the chassis control by wire system for the control of brake, throttle and steering by wire, control the control by wire system through the visual interface, and read the corresponding CAN commands, Carry out training and assessment related to the communication protocol of the chassis controlled by wire. The system framework and simulation interface of the chassis control by wire training system are shown in Figure 1 and Figure 2 respectively.

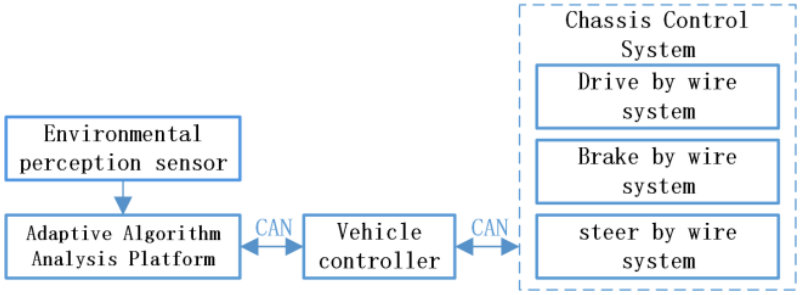

Fig. 1. Framework of chassis control by wire training system

Fig. 2. Chassis control by wire training system framework Visual interface of chassis control by wire training platform

3.2 Visual Practical Training Teaching Management System Based on B/S Structure.

The architecture design is based on the B/S three-level structure. The code management module is used as the basic platform of the system, and the acquisition module, communication module, statistical analysis module realize the integrated comprehensive functions of data acquisition, data communication, statistical analysis, etc. of the training teaching management system. Identity authentication devices are set in the main channels to and from the training place, and the authentication data is uniformly controlled and managed by the training teaching management system. The visual training management platform is used to promote the resource sharing and task modularization implementation of the base, query the use information of equipment, consumables, tools, equipment operation status information and curriculum arrangement information of various training types in real time, so that the hardware environment and facilities of each training room can be reasonably used and scientifically maintained. In the B/S three-level structure of the training and teaching management system, each level represents an independent service category. When creating relevant business services and information services, the planning theory is to select services as rules to implement planning, so that customers can maintain and expand the system in the future. The principle framework and application scenario of the practical teaching management system are shown in Figure 3 and Figure 4 respectively.

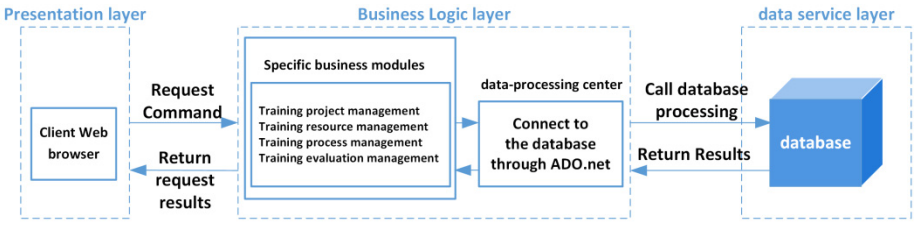

Fig. 3. Framework of practical teaching management system

Fig. 4. Application scenario of Practical Teaching Management

3.3 Intelligent practical training teaching evaluation system based on cloud platform

Considering the large number of teaching evaluation index data, the cloud platform is used to establish a data center to integrate the system's practical teaching data, and the top-level design of the use strategy of data resources is carried out to realize the automatic processing of teaching index data. In accordance with the concept of "based on data, intelligent analysis, targeted push

and accurate service", we will strive to promote the deep integration of new generation information technology and vocational education, establish a professional training evaluation system, develop a "three visibility and one accuracy" professional construction and operation monitoring platform, collect the full data of professional construction and talent cultivation process, compare target values, reflect the degree of goal achievement, and provide professional construction Teachers' development and students' growth accurately analyze the "portrait", real-time push learning information and evaluation results, accurately develop diagnosis and improve teaching programs and teaching methods, and achieve differentiated teaching. The principle block diagram and application data of the practical teaching evaluation system are shown in Figure 5 and Figure 6 respectively.

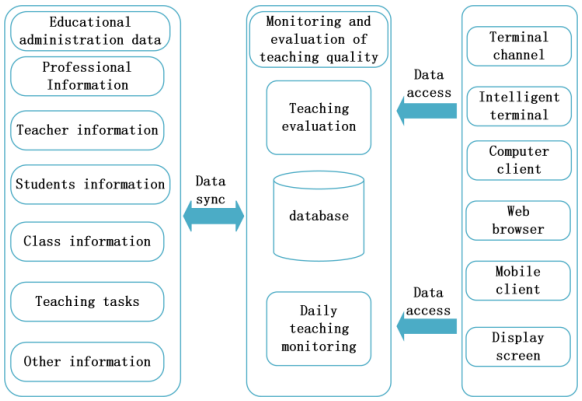

Fig. 5. Framework of practical teaching evaluation system

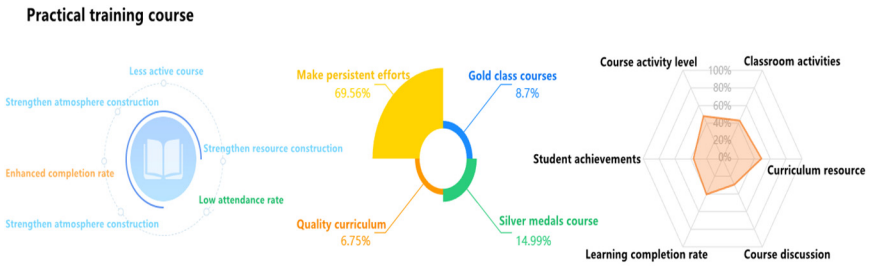

Fig. 6. Application data of practical teaching evaluation system

4 The Role of Digital Intelligence Training Base in Professional Construction

4.1 Innovative "Basic, Special, and Comprehensive" Integrated Practical Teaching System

The Intelligent Connected Vehicle Training Base, through the introduction of artificial intelligence technology, clarifies the development function positioning, innovatively cultivates and

incubates the operation mechanism of the base, and achieves precise integration of talent cultivation, employee training, and technical services. By integrating the resources of cooperative enterprises, the "Famous Teacher and Craftsman Demonstration Course" participated by renowned teachers from universities, major country craftsmen, and enterprise experts will be organically integrated into the training scene. The real tasks and products of the enterprise will be integrated into the teaching process, and according to the principle of "foundation special comprehensive", the demand for intelligent connected vehicle professional positions will be met, creating a practical teaching system that combines online and offline, virtual and real. We will jointly establish an industrial college between industry and education, carry out precise training of job types, adhere to the driving force of the production process, adhere to production in the learning process, learn in the production process, guide trainees to experience and learn the authentic production process in the internship and training context, improve the teaching practical operation proficiently technical job training chain, and build a skilled talent cultivation and incubation highland with technology leading and technological innovation as the primary driving force throughout the entire production process.

4.2 Promote the development mechanism of "collaboration, cooperation, and innovation" for the integration of industry and education.

Based on the construction of a digital intelligence training base, the service level of vocational colleges' training bases has been effectively improved in terms of project operation management, talent co training and sharing, base co construction and sharing, technical collaboration and research innovation mechanisms. Improve management system innovation and cooperation, allocate a strong faculty management team, gradually improve the governance system, reform the allocation mechanism, encourage school and enterprise personnel to actively participate in order cultivation, employee training, scientific research joint research and other projects, and create a collaborative development community. According to the principle of "collaborative cooperation and staggered development", we will build a "micro platform" matrix in multiple directions such as the research and development of new technologies and products for intelligent connected vehicles, as well as the assembly, debugging, testing, and fault repair of the entire vehicle and components. We can undertake high-level and high-level training, appraisal, and competition; Capable of supporting collaborative research such as process improvement and product development, producing a series of achievements, assisting the development of the regional intelligent connected vehicle industry, and continuously improving the social service capabilities of the training base.

4.3 Implement the "sharing, co training, and sharing" dual teacher team training path.

Based on the application of the digital intelligence training base, we will build a high-level "double teacher" team, implement dynamic selection of base teachers, increase class hour coefficient, and form a double teacher team to select masters, build master studios, and master studios. Practicing the dual teacher training path of teacher on-the-job integration, we will arrange a team of intelligent connected vehicle technology professional teachers to go to the technology center, testing center, and final assembly workshop of school enterprise cooperation enterprises for on-the-job internships during the winter and summer vacations, to understand the actual production situation and assist in the training of dual teacher types. Build a "dual teacher" talent sharing platform, relying on cooperative projects, jointly establish a talent introduction training

mechanism between industry and education, jointly appoint excellent high skilled talents, professional technical personnel, and teachers as training instructors, jointly build a platform to introduce specialized high-end talents, jointly solve talent placement problems, hold technical training for trainers, pass on and guide trainers, accumulate technical practical experience, and achieve talent sharing, Talent co cultivation, talent sharing.

5 Conclusions

Based on the background of the construction of the training base of Hunan Automotive Engineering Vocational College, from the perspective of the combination of the training base and the "digital intelligence" technology, starting from the basis of the integration of production and education and the positioning of skilled personnel training, this paper studies and explores the construction path of the digital intelligence training base of higher vocational colleges, demonstrates, guides and promotes the Digital transformation and upgrading of the training base of higher vocational colleges, and enriches the content of the national intelligent education platform, Assist in the high-quality development of vocational education.

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